REMARKS

Herein, the "Action" or "Office Action" refers to the Office Action dated November 25, 2003.

Applicant respectfully requests reconsideration and allowance of all of the claims of the application. Claims 1, 3-9, 11-41 are presently pending. Claims amended herein are 1, 5, 6, 8, 9, 11-14, 16-24, 28, and 34. Claims withdrawn or cancelled herein are 2 and 10. New claims added herein are 35-41.

Formal Objections

Specification

The Office notes few inconsistencies and errors in the specification. Applicant amends the specification accordingly.

Drawings

The Office objects to the Figs. 2 and 6 of the drawings.

The Office indicates that a reference number in the description is missing from Fig. 2. Rather than amend Fig. 2, Applicant amends the text to remove the reference number.

The Office indicates that reference numbers in the description are missing from Fig. 6. Applicant amends Fig. 6 to include the omitted reference numbers. That amended drawing is submitted with this amendment and is labeled "Replacement Sheet."

Claim Objections

The Office objects to claims 5, 6, 12-14, 17, 28, and 34 for various informalities involving apparent typographical errors. Applicant amends those claims to correct the informalities.

The Office objects to claims 18 and 19 as being duplicates of claims 8 and 13, respectively. Applicant amends claims 8 and 13 so that they are no longer duplicates.

Formal Claim Rejections

Claim Rejections under §112

The Office rejects claims 23 and 28 as being indefinite.

The Office indicates that the phrase "operating system" of claim 23 renders it indefinite because it is not clear whether the operating system refers to a software or hardware. Applicant amends claim 23 to clarify that it refers to software.

The Office indicates that the phrase "the digital signal" of claim 28 renders it indefinite because it is not clear which signal the claim is referring Applicant amends claim 28 to clarify that it refers to the "marked signal" of claim 24.

Substantive Claim Rejections

Claim Rejections under §101

The Office rejects claims 1, 9, 14, 16, 24, 30, and 34 under USC § 101, which reads:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The Office indicates that these claims are directed to non-statutory subject matter. Applicant respectfully traverses the rejections of these claims. The Office explains that "signal cited in these claims is not embodied in a computer hardware."

Rather than being directed towards "signals," the subject matter of each of the claims 1, 9, 14, 16, and 30 is directed towards a "method."

For example, claim 1 below illustrates the subject matter of claims 1, 9, 14, 16, and 30:

> 1. A method for concealing data within a digital signal, the method comprising:
>
> receiving a first data pattern of discrete values and a second data pattern of discrete values;
> imposing a discrete value of the second data pattern over one
> or more values of the first data pattern

Applicant submits that method claims, like those at issue here, fall within the "process" category of the four enumerated categories of patentable subject matter in §101. Therefore, such method claims are statutory.

Accordingly, Applicant asks the Office to withdraw its rejection of these claims.

Claims 24 and 34 are indeed directed towards a "signal." Applicant amends those claims accordingly.

Claim Rejections under §102 and §103

The Office rejects at least some of the pending claims under §102 and/or §103. For the reasons set forth below, the Office has not shown that cited references anticipate (under §102) the rejected claims. For the reasons set forth below, the Office has not made out a *prima facie* case of obviousness (under §103). Accordingly, Applicant respectfully requests that the rejections be withdrawn and the case be passed along to issuance.

The Office's rejections are based upon the following reference:

- **Shur**: *David Shur*, US Patent No. 6,330,672;

- **Tao**: *Bo Tao*, US Patent No. 6,192,139;

- **Zhao**: *Zhao et al.,* "A Generic Digital Watermarking Model", Computer. & Graphics, Vol. 22, No. 4, pp. 397-403 (1998);

Overview of the Application

The Application describes techniques directed towards an audio watermarking technology for inserting and detecting watermarks in audio signals, such as a music clip. The watermark identifies the content producer, providing a

signature that is embedded in the audio signal and cannot be removed. The watermark is designed to survive all typical kinds of processing, including compression, equalization, D/A and A/D conversion, recording on analog tape, and so forth. It is also designed to survive malicious attacks that attempt to remove or modify the watermark from the signal, including changes in time and frequency scales, pitch shifting, and cut/paste editing.

In one described implementation, a watermarking system employs covert channel encoder to layer an additional information data message on top of the watermark. Thus, an informational message is imposed upon the existing watermark encoded in a signal.

In another described implementation, a watermarking system employs a permutation technique to further hide the watermark and it may hide the covert message within the watermark. The order in which data is imposed or encoded is rearranged based upon a permutation table. The same table is used to reverse permute the data at the detector.

Cited References

The Office cites either **Shur** or **Tao** as its primary references in its anticipation-based rejections. The Office cites **Shur** as its primary references in all of its obviousness rejections. The Office cites **Zhao** as its secondary reference in its obviousness rejections.

Shur

Shur describes a technology for inserting a digital watermark into protected information. It includes a perceptual coder for coding an information signal

representative of the protected information, a watermark location selector responsive to the perceptual coder for selecting a location for inserting a digital watermark, a digital watermark generator for generating a digital watermark and a quantizer of the perceptual coder responsive to the digital watermark detector and the watermark location selector for inserting a digital watermark at selected locations within an output bitstream including the perceptually coded information signal.

Tao

Tao describes a technology for encoding watermark information such as copyright information within digital data representing, for example, still and video images.

A sequence of bits representing the watermark information is mapped into a first plurality of groups such that the first plurality of groups includes more bits than the sequence of bits. The bits from each group of the first plurality of groups are interleaved to form a second plurality of groups. The bits from the second plurality of groups are serialized to form an encoded sequence of bits. Coefficients representing the digital data are modified according to the encoded sequence of bits.

In one embodiment, a coefficient is made into an even number when the bit has a first value and the coefficient is made into an odd number when the bit has a second value. In one embodiment, the digital data are in a compressed format (e.g., JPEG or MPEG). The digital data can be subsequently read to retrieve the

encoded sequence, and the encoded sequence is then decoded and compared to the original watermark information.

Zhao

Zhao presents a generic model of digital watermarking techniques based on the following principles: steganography, spread spectrum communications technology, and perceptibility restriction and noise theory. Concepts and functional modules are developed in this paper to describe an abstract scheme of digital watermarking methods. This generic model provides a common basis to study many existing watermarking systems and to evaluate their performance and characteristics. A variety of watermarking methods can be derived from this generic model and several of them are discussed in this paper.

Anticipation Rejections

Based upon Shur

The Office rejects claims 1-15 and 18-29 under USC § 102(e) as being anticipated by **Shur**. Applicant respectfully traverses the rejections of these claims. Based on the reasons given below, Applicant asks the Office to withdraw its rejection of these claims.

Claim 1

With the cited portions of **Shur** provided in brackets, this amended claim recites:

- receiving a first data pattern of discrete values and a second data pattern of discrete values; [col. 2 and col. 3, lines 40-67]

- imposing a discrete value of the second data pattern over one or more values of the first data pattern; [col. 2 and col. 3, lines 40-67]

- encoding a third data pattern into the digital signal, wherein such third data pattern is the result of the imposing. [col. 9, lines 38-50]

In order to anticipate this claim, Applicant submits that **Shur** must disclose every element and feature of the claim and that they must be arranged in the same manner as the claim. Applicant respectfully submits that **Shur** does not disclose all of the claimed elements and features of this claim.

The Office indicates that **Shur** discloses "encoding a third data pattern into the digital signal" (as recited by amended claim 1). To support its position, the Office cites col. 9, lines 38-50of **Shur**, which is reproduced here:

There are likewise various possibilities for encoding the digital watermark data via watermark generator 130 as well. For example, where C(i), as above, equals one, and if T(f), the threshold function, is the perceptual threshold at spectral coefficient f for the ith member of the candidate watermarking sequence, then a one may be encoded as 2T(f)/3 and a zero as T(f)/3.

There are likewise various possibilities for encoding the digital watermark data via watermark generator 130 as well. For example, where B(i), as above, equals one. For example, if T(f), the threshold function, is the perceptual threshold at spectral coefficient f for the ith member of the candidate

watermarking sequence, then a one may be encoded as 2T(f)/3 and a zero as T(f)/3.

Instead of disclosing the "encoding of a third data pattern," **Shur** discloses constraints (e.g., C(i) and B(i)) and thresholds (e.g., T(f)) that may affect **Shur's** "encoding the digital watermark." Applicant submits that **Shur** does not disclose a third data pattern and, consequently, does not disclose the encoding of its undisclosed third data pattern. Furthermore, **Shur** does not the undisclosed "third data pattern is the result of the imposing," as recited in this claim.

As shown above, **Shur** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claims 3-7

These claims ultimately depend upon independent claim 1. As discussed above, claim 1 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

Claims 18, 20, and 22

The Office indicates that these independent claims "recite the same limitations as the rejected claims 1 and 2. Therefore, [these claims] are rejected

for the same rationale as the rejection of claims 1 and 2." If the Office's assertion is true, then Applicant submits that these claims are allowable for the same rationale given above in Applicant's response to the rejection of claims 1 and 2.

Claim 23

This claim ultimately depends upon independent claim 22. As discussed above, claim 22 is allowable.

In addition to its own merits, this dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of this dependent claim because its base claim is allowable.

Claim 9

Citing col. 11, lines 25-55 of **Shur**, rejects this claim. This amended claim recites:

- receiving a digital signal, the signal having an watermark encoded therein, the watermark being an encoded data pattern representing multiple data patterns comprising an original watermark data pattern and a covert data pattern;
- extracting a discrete value of the covert data pattern from a plurality of values of the encoded data pattern.

The cited portion of **Shur** does not disclose a "watermark being an encoded data pattern representing multiple data patterns comprising an original watermark

data pattern and a covert data pattern." Instead, Shur discloses a typical watermark.

The Office has not identified where **Shur** discloses a "covert data pattern." Furthermore, it has not identified where **Shur** discloses the watermark being encoded represents "multiple data patterns comprising an original watermark data pattern and a covert data pattern."

As shown above, **Shur** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claims 11 and 12

These claims ultimately depend upon independent claim 9. As discussed above, claim 9 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

Claim 19

Citing col. 11, lines 25-55 of **Shur**, rejects this claim. This amended claim recites:

- receiving a digital signal, the signal having an watermark encoded therein, the watermark being an encoded data pattern representing multiple data patterns comprising an original watermark data pattern

and a covert data pattern;

- extracting a discrete value of the covert data pattern from a plurality of values of the encoded data pattern.

The cited portion of **Shur** does not disclose a "watermark being an encoded data pattern representing multiple data patterns comprising an original watermark data pattern and a covert data pattern." Instead, Shur discloses a typical watermark.

The Office has not identified where **Shur** discloses a "covert data pattern." Furthermore, it has not identified where **Shur** discloses the watermark being encoded represents "multiple data patterns comprising an original watermark data pattern and a covert data pattern."

As shown above, **Shur** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 21

Citing col. 11, lines 25-55 of **Shur**, rejects this claim. This amended claim recites:

- receive a digital signal, the signal having an watermark encoded therein, the watermark being an encoded data pattern representing multiple data patterns comprising an original watermark data pattern and a covert data pattern;
- extract a discrete value of the covert data pattern from a plurality of

values of the encoded data pattern.

The cited portion of **Shur** does not disclose a "watermark being an encoded data pattern representing multiple data patterns comprising an original watermark data pattern and a covert data pattern." Instead, **Shur** discloses a typical watermark.

The Office has not identified where **Shur** discloses a "covert data pattern." Furthermore, it has not identified where **Shur** discloses the watermark being encoded represents "multiple data patterns comprising an original watermark data pattern and a covert data pattern."

As shown above, **Shur** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 24

With the cited portions of **Shur** provided in brackets, this amended claim recites:

- receiving an original watermark data pattern of discrete values and a covert data pattern of discrete values;

- imposing a discrete value of the covert data pattern over one or more values of the original watermark data pattern; [col. 2-3]

- encoding results of the imposing within an unmarked signal to produce the marked signal. [col. 4, lines 45 et seq.]

The cited portion of **Shur** does not disclose a "imposing a discrete value of the covert data pattern over one or more values of the original watermark data pattern." Instead, **Shur** discloses the use of a typical watermark with a signal.

The Office has not identified where **Shur** discloses a "covert data pattern." Furthermore, it has not identified where **Shur** discloses imposing that undisclosed covert data pattern over "one or more values of the original watermark data pattern."

As shown above, **Shur** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 14

With the cited portions of **Shur** provided in brackets, this amended claim recites:

> A method for encoding a watermark with a covert message into a digital audio signal, wherein binary bits of the watermark may be encoded into the signal in multiple states [col. 3, lines 40-65 and col. 11, lines 3-6], the method comprising:
>
> - encoding multiple bits of the watermark into the digital signal into a state that indicates a discrete value of the covert message. [col. 3, lines 40-65 and col. 4]

The cited portion of **Shur** does not disclose a "encoding multiple bits of the watermark into the digital signal into a state that indicates a discrete value of the

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covert message." The Office has not identified where **Shur** discloses encoding a watermark with a covert message. Furthermore, the Office has not shown where **Shur** discloses multiple bits of that watermark encoding a portion of that covert message.

As shown above, **Shur** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 15

This claim ultimately depends upon independent claim 14. As discussed above, claim 14 is allowable.

In addition to its own merits, this dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of this dependent claim because its base claim is allowable.

Based upon Tao

The Office rejects claims 30-34 under USC § 102(a/e) as being anticipated by **Tao**. Applicant respectfully traverses the rejections of these claims. Based on the reasons given below, Applicant asks the Office to withdraw its rejection of these claims.

Claim 30

With the cited portions of **Tao** provided in brackets, this claim recites:

- receiving a set of data having an original order; [col. 5, lines 1-8]

- permuting the set of data so that it is in a different order than the original; [col. 5, lines 1-8]

- encoding the permuted set of data into the digital signal. [col. 5, lines 1-8]

Applicant submits that **Tao** does not disclose these features and elements. The cited portion (col. 5, lines 1-8) of **Tao** states the following:

> [The present invention pertains to a method and system thereof for encoding watermark information such as copy-]right information within digital data representing, for example, still images (including text) and video images. Particular locations within the digital data are modified in accordance with the present invention in order to embed the encoded watermark in the digital data. The digital data at each particular location can be subsequently read to retrieve the encoded watermark, and the encoded watermark is then decoded.

Applicant submits that **Tao** does not disclose use of permutation. It does talk about encoding information into "particular locations within the digital data." Applicant asks the Office to explain how and why that would be considered a permutation.

In general, Applicant asks the Office to particular point to the portions of **Tao** that recites permutation of a set of data and encoding of the permuted data.

As shown above, **Tao** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 31 and 32

These claims ultimately depend upon independent claim 30. As discussed above, claim 30 is allowable.

In addition to its own merits, each of these dependent claims is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each of these dependent claims because its base claim is allowable.

Claim 33

With the cited portions of **Tao** provided in brackets, this claim recites:

- receiving a set of data having an original order; [col. 5, lines 1-8]

- permuting the set of data so that it is in a different order than the original; [col. 5, lines 1-8]

- encoding the permuted set of data into the digital signal. [col. 5, lines 1-8]

Applicant submits that **Tao** does not disclose these features and elements. The cited portion (col. 5, lines 1-8) of **Tao** states the following:

[The present invention pertains to a method and system thereof for encoding watermark information such as copy-]right information within digital

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data representing, for example, still images (including text) and video images. Particular locations within the digital data are modified in accordance with the present invention in order to embed the encoded watermark in the digital data. The digital data at each particular location can be subsequently read to retrieve the encoded watermark, and the encoded watermark is then decoded.

Applicant submits that **Tao** does not disclose use of permutation. It does talk about encoding information into "particular locations within the digital data." Applicant asks the Office to explain how and why that would be considered a permutation.

In general, Applicant asks the Office to particular point to the portions of **Tao** that recites permutation of a set of data and encoding of the permuted data.

As shown above, **Tao** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 34

With the cited portions of **Tao** provided in brackets, this claim recites:

- receiving a set of data having an original order; [col. 5, lines 1-8]

- permuting the set of data so that it is in a different order than the original; [col. 5, lines 1-8]

- encoding the permuted set of data into the digital signal to produce the modulated signal with a permuted data channel encoded therein. [col. 5, lines 1-8]

Applicant submits that **Tao** does not disclose these features and elements. The cited portion (col. 5, lines 1-8) of **Tao** states the following:

33

[The present invention pertains to a method and system thereof for encoding watermark information such as copy-]right information within digital data representing, for example, still images (including text) and video images. Particular locations within the digital data are modified in accordance with the present invention in order to embed the encoded watermark in the digital data. The digital data at each particular location can be subsequently read to retrieve the encoded watermark, and the encoded watermark is then decoded.

Applicant submits that **Tao** does not disclose use of permutation. It does talk about encoding information into "particular locations within the digital data." Applicant asks the Office to explain how and why that would be considered a permutation.

In general, Applicant asks the Office to particular point to the portions of **Tao** that recites permutation of a set of data and encoding of the permuted data.

As shown above, **Tao** does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Obviousness Rejections

Lack of *Prima Facie* Case of Obviousness (MPEP § 2142)

Applicant disagrees with the Office's obviousness rejections. Arguments presented herein point to various aspects of the record to demonstrate that all of the criteria set forth for making a *prima facie* case have not been met.

Based upon Shur and Zhao

The Office rejects 16 and 17 under USC § 103(a) as being unpatentable over **Shur** as modified by **Zhao**. Applicant respectfully traverses the rejections of these claims. Applicant asks the Office to withdraw its rejection of these claims.

Claim 16

With the cited portions the references provided in brackets, this amended claim recites:

- generating multiple watermarks; [**Zhao**: p. 401]

- assigning each of the multiple watermarks to each of the possible discrete values for at least a portion of the covert message; [**Shur**: col. 4, lines 56-64]

- selecting a watermark that corresponds to an actual discrete value of at least a specific portion of the covert message; [**Shur**: col. 11, lines 35-56; col. 4, lines 45-64]

- encoding the selected watermark into the signal. [**Shur**: col. 4, lines 45-64]

The Office indicates that **Shur** discloses all of the recited features elements except for the generation of multiple watermarks, which it indicates is taught by **Zhao**.

Applicant submits that **Shur** does not disclose these features and elements. The Office indicates that the col. 4, lines 45-64 of **Shur** disclose the "assigning,"

"selecting," and "encoding" elements and features as recited in the claim. Applicant reproduces that cited text here:

> [col. 4, lines 45-64] In summary then, apparatus for inserting a digital watermark into protected information comprises a perceptual coder for coding an information signal representative of the protected information, a watermark location selector responsive to the perceptual coder for selecting a location for inserting a digital watermark, a digital watermark generator for generating a digital watermark and a quantizer of the perceptual coder responsive to the digital watermark detector and the watermark location selector for inserting a digital watermark at selected locations within an output bitstream including the perceptually coded information signal.

> A method for inserting a digital watermark into protected information comprises the steps of perceptually encoding an information signal representative of the protected information, selecting, responsive to the perceptual coding step, a location for inserting a digital watermark, generating a digital watermark, and during perceptual coding, quantizing the information signal to insert the generated digital watermark at selected locations within an output bitstream including the perceptually coded information signal.

Applicant submits that **Shur** does not disclose "assigning each of the multiple watermarks to each of the possible discrete values for at least a portion of the covert message." Indeed, Applicant sees no mention in the cited text of assignment of watermarks to discrete values of a covert message. Furthermore, Applicant is unable to identify where **Shur** teaches of the covert message.

Applicant submits that **Shur** does not disclose "selecting a watermark that corresponds to an actual discrete value of at least a specific portion of the covert message." Indeed, Applicant sees no mention in the cited text of selection of watermarks. The selection being done by Shur is related to the location in the

signal where the watermark may be encoded. But it does not select a watermark itself. Furthermore, Applicant is unable to identify where **Shur** teaches of the covert message.

Furthermore, the Office indicates that the col. 11, lines 35-56 of **Shur** disclose the "selecting a watermark that corresponds to an actual discrete value of a specific portion of the covert message" as recited in the claim. Applicant reproduces that cited text here:

> **[col. 11, lines 35-56]** In a further alternative embodiment, it may be advantageous to detect and extract a watermark in the decoded bitstream to intentionally insert a synchronization marker at the beginning of the stream. (Placing synchronization markers, however, may assist the pirate in locating the digital watermark.) Nevertheless, the synchronization marker may comprise constant data that need not necessarily comprise the watermark such as data representing the copyright owner, the source, and the identity of the protected work for example by title, track and artist, as some of these should be well known from the protected work itself Title, track and artist may be present for display, for example, in digital program delivery systems known in the art.

> In the design of apparatus for playing a watermarked original or pirate copy, a specific field (for example, the encoding algorithm type) is inserted into the watermark. The encryption key and the watermarking sequence are derived from a private key issued to the purchaser at the point of distribution. A decoder apparatus associated with any player will receive the private key and decrypt the watermark to extract the specific field. Play can cease shortly after play begins if the field cannot be found.

Applicant submits that **Shur** does not disclose "selecting a watermark that corresponds to an actual discrete value of at least a specific portion of the covert message." Indeed, Applicant sees no mention in the cited text of selection of watermarks. The selection being done by Shur is related to the location in the

signal where the watermark may be encoded. But it does not select a watermark itself. Furthermore, Applicant is unable to identify where **Shur** teaches of the covert message.

Applicant asks the Office to particular point to the portion of **Shur** that disclose the recited features and elements.

As shown above, the combination of the cited references does not disclose all of the claimed elements and features of the claim. Accordingly, Applicant asks the Office to withdraw its rejection of this claim.

Claim 17

This claim ultimately depends upon independent claim 16. As discussed above, claim 16 is allowable.

In addition to its own merits, this dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of this dependent claim because its base claim is allowable.

Dependent Claims

In addition to its own merits, each dependent claim is allowable for the same reasons that its base claim is allowable. Applicant submits that the Office withdraw the rejection of each dependent claim where its base claim is allowable.

Conclusion

All pending claims are in condition for allowance. Applicant respectfully requests reconsideration and prompt issuance of the application. If any issues remain that prevent issuance of this application, the Office is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

Dated: 5-24-04   By: _____
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